LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

CLAIMS

What is claimed is:

1. (Original) A semiconductor laser, comprising:

a first optical gain element that generates a first light beam having a first optical frequency;

a second optical gain element that generates a second light beam having a second optical frequency;

an optical frequency mixer that is coupled to said first and second gain elements and

generates a polarization wave at a third optical frequency; and

a near-field phase grating that couples a power from the polarization wave to an electromagnetic wave propagating at the third optical frequency.

- 2. (Original) The laser of claim 1, wherein the third optical frequency is in the midinfrared, long-infrared or Terahertz regions.
- 3. (Original) The laser of claim 1, wherein said optical frequency mixer includes a waveguide optically coupled to said first and second gain elements.
- 4. (Original) The laser of claim 1, wherein the electromagnetic wave propagates in a direction essentially perpendicular to a propagation direction of the first and second light beams.

- 5. (Original) The laser of claim 1, wherein the semiconductor laser is fabricated with group III-V material.
 - 6. (Original) A semiconductor laser, comprising:

a first optical gain element that generates a first light beam having a first frequency,

a second optical gain element that generates a second light beam having a second frequency;

mixing means for mixing the two light beams to create a polarization wave at a third optical frequency, and;

means for coupling a power of the polarization wave to an electromagnetic wave propogating at the third optical frequency.

- 7. (Original) The laser of claim 6, wherein the third optical frequency is in midinfrared, long-infrared or Terahertz regions.
- 8. (Original) The laser of claim 6, wherein said mixing means includes a waveguide for mixing said first and second light beams.
- 9. (Original) The laser of claim 6, wherein the electromagnetic wave propagates in a direction essentially perpendicular to a propagation direction of the first and second light beams.
- 10. (Original) The laser of claim 6, wherein the semiconductor laser is fabricated with group III-V material.

- 11. (Original) A method for operating a semiconductor laser, comprising:

 generating a first light beam having a first optical frequency;

 generating a second light beam having a second optical frequency;

 mixing the two light beams to create a polarization wave at a third optical frequency, and, coupling a power of the polarization wave to an electromagnetic wave propogating at the third optical frequency.
- 12. (Original) The method of claim 11, wherein the third optical frequency is in the mid-infrared, long-infrared or Terahertz regions.
- 13. (Original) The method of claim 11, wherein the first and second light beams are mixed in a waveguide.
- 14. (Original) The method of claim 11, wherein the electromagnetic wave propagates in a direction essentially perpendicular to a propagation direction of the first and second light beams.